

**AMENDMENTS TO THE DRAWINGS**

Figure 8 is amended to add the label “Prior Art”

Attachment: One Replacement Sheet

**REMARKS**

Claims 1-8 are all the claims pending in the application. Claims 7 and 8 are newly added.

No new matter is added.

**Rejection under 35 U.S.C. § 102**

Claims 1-6 are rejected under 35 U.S.C. § 102(b) as being anticipated by Endo (U.S. Patent No. 6,240,350, hereinafter "Endo"). Applicant respectfully traverses this rejection.

Independent claim 1 recites:

An electric power steering apparatus, which controls a motor that gives a steering assisting force to a steering mechanism based on an electric current controlling value which is computed from a motor electric current command value which has been computed by a computing device based on a steering torque generated in a steering shaft and an electric current value of the motor, the electric power steering apparatus comprising

**a self-aligning torque estimating section which estimates a self-aligning torque by a disturbance observer constitution; and**

a steering torque feedback section which computes a steering reaction force based on a self-aligning torque estimated value which has been estimated by the self-aligning torque estimating section and feeds the result back to the steering torque.

Endo disclosed the convergence controller 340 (Fig. 4) to give a yaw. In Endo, the process in which the amended torque computed based on a convergence signal CN output from the convergence controller 340 is output from the motor and it is transmitted to the tire, and the damping is given to the yaw rate of vehicle, is described by using the models of Figures 5-10.

Further, in Endo, the self-aligning torque TS is disclosed as a function of a slip angle  $\beta$ , a yaw rate  $\gamma$  and an actual steering angle  $\delta$ . That is, in Endo, the self-aligning torque Ts is used as a middle parameter for explaining the damping of the yaw rate, and Endo does not have a control component using the self-aligning torque Ts; The "control apparatus for electric power steering system" that is the subject matter of the invention disclosed in Endo does not estimate the self-

aligning torque  $T_s$ , as evidenced by the fact that there is no component for estimating the self-aligning torque  $T_s$  in Fig. 4. Further, in Endo a slip angle  $\beta$ , a yaw rate  $\gamma$  and an actual steering angle  $\delta$  are used as inputs of the formula for computing the self-aligning torque  $T_s$ ; and lastly, Endo does not disclose the control component and the computation which use the disturbance observer constitution.

The invention as described in claim 1 **estimates the self-aligning torque by the disturbance observer constitution**. The disturbance observer constitution is a control component used in control engineering. In the present invention, the disturbance observer constitution is described in the self-aligning torque estimating section 110 of Fig. 1.

In Endo, the self-aligning torque is computed by the constitution according to the Expressions (3) -(4) , and not by the disturbance observer constitution.

Further, the invention described in claim 1 is based on the self-aligning torque estimated by the disturbance observer constitution, the steering reaction force  $AT$  is computed in the steering torque feedback section 120 of Fig. 1, and it is feedback to the steering torque. In Endo, such constitution is not disclosed.

Next, the invention as described in claim 2 of the present invention estimates the self-aligning torque from a motor rotation signal or an angular speed signal and the motor electric current command value.

However, in Endo, the self-aligning torque  $T_s$  is computed by the constitution such as the Expressions (3)-(4) that a slip angle  $\beta$ , a yaw rate  $\gamma$  and an actual steering angle  $\delta$  are inputs. In Endo, the constitution which estimates the self-aligning torque from a motor rotation signal or an angular speed signal and the motor electric current command value according to the present invention is not disclosed.

The present invention solves the problem that the tuning of the road surface information, the disturbance information and the steering stability are independently performed, by feeding back the steering reaction force AT computed based on the estimated self-aligning torque to the steering torque.

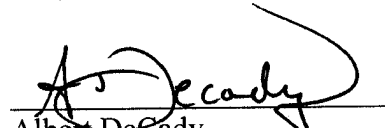
For all the reasons stated above, Applicant respectfully submits that the claimed invention is not anticipated by Endo. Accordingly, Applicant respectfully requests the withdrawal of the rejection and earnestly solicits the allowance of the claims. Claims 3-8 are patentable at least by virtue of their dependency on claims 1 or 2.

### Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

  
Albert DeCady  
Registration No. 60,658

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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